Nova Scotia Forest Inventory

Based on Forest Inventory Permanent Sample Plots Measured between 1994 and 1998

NOVA SCOTIA
Natural Resources

Report FOR 2000 - 1

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1.0 INTRODUCTION

Nova Scotia Forest Inventory Permanent Sample Plots provide a valuable source of information on our forest resources. They provide a sample of the volumes within our forests which can be expanded to calculate an estimate of the merchantable volume for the Province. This report uses data from 1,923 inventory plots measured over the 5 year period from 1994 to 1998. Approximately 1760 plots were established between 1965 and 1970, with the remainder established in 1998. All plots were randomly located within forested land. This report provides a comparison to the forest inventory figures from the photo interpretation inventory[1]. The results are presented in tabular form using a similar format as the Forest Resources Inventory Report (NSDNR, FOR 1999-1) which publishes the photo interpretation inventory.

1.1 Background

A forest inventory within Nova Scotia has been regularly produced since 1968. Data for these inventories has been collected by several methods. The first two inventories were based upon strip cruise data, followed by a 3-P cruise from 1981 to 1991. From 1992 to 1997, data was collected by the point sample method, however, in 1998 this method was dropped due to cost reductions, after 5 counties were cruised. By 1996, every forest stand in the entire province had been Photo interpreted, and compiling the data into a forest resources database within a GIS provided us with the opportunity to redirect our efforts. Confidence in the photo interpreted forest database was confirmed when we were able to report a favourable comparison between these volumes and those compiled from our intensive point sample cruise in the 5 counties. The discontinuance of this point sample cruise provided the opportunity to increase the number of permanent sample plots, in the continuous forest inventory monitoring system. For more information on this program, please refer to Appendix II.

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[1] *The Photo Interpretation was from photos taken between 1988 and 1997, and the PSP's were measured between 1994 and 1998, so the average age comparison is 3.5 years apart.*

2.0 METHODS

The permanent sample plot (PSP) data is expanded to Provincial estimates by combining average plot values within designated strata with forested areas from the photo interpreted inventory[2]. The two classes of areas used from this photo interpreted inventory are:

1. Total Forested Area, includes 4 categories of forest cover[3].
    a. Softwood,
    b. Mixedwood,
    c. Hardwood, and
    d. Other.

2. Ownership of the Forested Lands.

The "Other" Forest Cover category is for unclassified stands which do not have a species assigned. The Photo Interpreters were unable to confidently say what was growing on these sites. In the photo interpretation inventory, this area comprised 8.5% of the total forest land, so 8.5% of the lowest volume PSP's were removed[4]. The remaining 1760 plots were used to get Age class, BA class, MV class, Land Capability etc. and the compiled volumes were distributed by the area of Forest Cover Type as determined by Photo Interpretation. To determine area distribution by age class on Crown land - softwood stands, the average age class was calculated for each plot. The number of plots in each age class was then divided by the total number of plots on Crown - softwood land. The resultant representative fraction (rf) was applied to the total Crown softwood area to give area by age class for Crown softwood (SW) land. A more explicit example follows:

Example: 81-100 year old SW stands on Crown Land.
Number of PSP's located in Crown, SW Stands: 310
Number of these PSP's that are 81-100 years old: 51
Percent (rf): 51/310 = 16.45%
Area of Crown Softwood Stands from GIS: 706,835 ha
Resultant area of 81-100 yr Crown SW Stands; 706,835 *0.1645 = 116,285 ha

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[2]Photo Interpretation Inventory refers to the Forest Resources database resident in the NSDNR Geographical Information System and specifically, the forest database as published in September 1999.

[3]Forest Cover was determined on the plots from the Merchantable Basal Area. It was found that Total Basal Area appeared to pick up Unmerchantable Basal Area which was not recorded by the original interpretation. The result of using TBA resulted in less Softwood, and more Mixedwood Cover Type than photo interpretation indicated. It was therefore decided to use MBA to define Forest Cover for the plots.

[4]This comprises an area of 35.8 M hectares, or 8.5% of the forest land. In the PSP's, this percentage was much lower, with only 52 plots, or 2.7% of the plots without a forest cover type to define them. It was decided to apply the 8.5% unclassified area to the PSP's, to permit the use of the GIS areas. Therefore, the 52 plots, plus an additional 111 of the lowest volume plots were dropped to give us 163 or 8.5% of the plots as "Other". It was felt that with the very low volume on these plots (≤ 2.04 m³/ha (0.4 cds/acre)) it was quite conceivable that the Photo Interpreters could not classify them. Only the remaining 1760 plots were then used for computations in all of the following tables. In other words, the values from 91.5% of the PSP's were distributed over 91.5% of the GIS forested area.

3.0 RESULTS

The results of the compilations appear in Tables 1 to 7 in Appendix I. Highlights of some of the more interesting results are briefly described in the following sections.

3.1 Merchantable Volume

Merchantable volume[5] for the province, using PSP data, is estimated at 411 million cubic metres. This is 4.5% higher than the figure generated by the GIS forest database. The average PSP volume/ha was expanded to Provincial values using GIS area. The question arises; what merchantable volume would the PSP's give without using forest cover type areas from GIS? To answer this, the average volume (96.92 m^3/ha)[6] of the PSP's was calculated for the entire 1923 plots, then, this number was multiplied by the total area of forested lands for the province (4,226,563 ha). The result is 409.6 million cubic metres, which is 4.0% higher than the figure generated by the GIS forest database. It is only 0.5% lower than the estimated figure in Table 2 which uses GIS areas by forest Cover Type and Ownership. Plot calculated volumes represent the merchantable bole of the recorded trees, and are not categorized by product or quality at this time[7].

3.2 Age Class

Plot age is calculated for forest plots as the average of the 3 trees closest in diameter to the tree of average basal area for the plot. These three trees are cored and their age at breast height is recorded. The Land Capability for the plot is used to determine the years from stump height to breast height. These years are added to each tree, and then the 3 tree ages are averaged to get the average age of the plot. For some plots, the age data was not available. In each of these cases, the age was assumed to be in the "0 to 20 years" category[8].

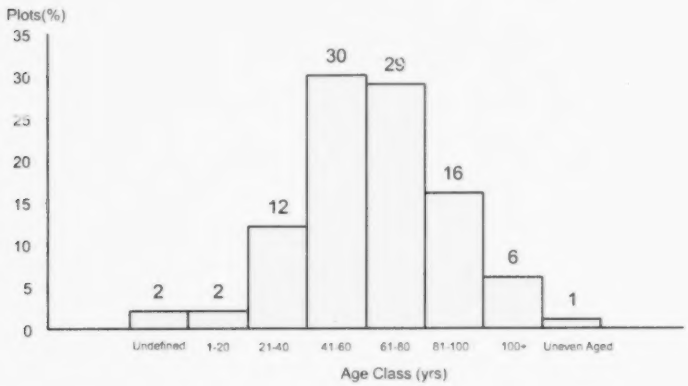

Figure 1 Forest Inventory Plots by Age Class (yrs).

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[5] *Merchantable Volume is the wood fibre in trees 9.1 cm DBH outside bark and larger that is contained between a 15 cm high stump and an inside bark top diameter of 7.6 cm.*

[6] *The average of 96.92m^3/ha has a 95% confidence interval of $\pm$3.54 m^3.*

[7] *Although not part of this report, in the future it will be possible to combine species with age, product category and damage codes to give a more complete description of the forest inventory.*

[8] *While this may not always be true, it is seen as a consistent resolution to an unresolvable problem. The majority of these plots would be harvested areas in which regeneration has not yet reached breast height. It is planned that the age for these plots will be assigned during the next plot remeasurement.*

Plot ages show the forest has a multi-age structure which has a distinct peak in the "41-60 age class" (Figure 1). One aspect of the present inventory plots is that we do not try to estimate whether a plot is unevenaged. Those that appear, were assigned this category before 1998. Although not a part of this report, a future compilation of Age Class combined with Species will allow for Maturity assignments (ie regen, young, pole etc.) of these plots. While sharing the same peak age with the Photo Interpretation Inventory, the plots suggest an older forest.

3.3 Basal Area

The plot basal[9] area was used to distribute Provincial area by Forest Cover Type in Table 4 (Appendix I). As expected, as the Basal Area Class increases, there is a slight increase in average age category. As a general rule, fully stocked hardwood stands could contain around 30 m^2/ha while softwood stands could contain around 50 m^2/ha. Figure 2 shows the Plots by Basal Area Class for the Province. While both the Plots and Photo Interpretation agree on an average stocking level, the plots suggest a different distribution by area than the Photo Interpretation. In the plots the first 2 BA classes contain twice as much area, and only one half the area in the 3rd class (21-30) m^2/ha) as compared with photo interpretation.

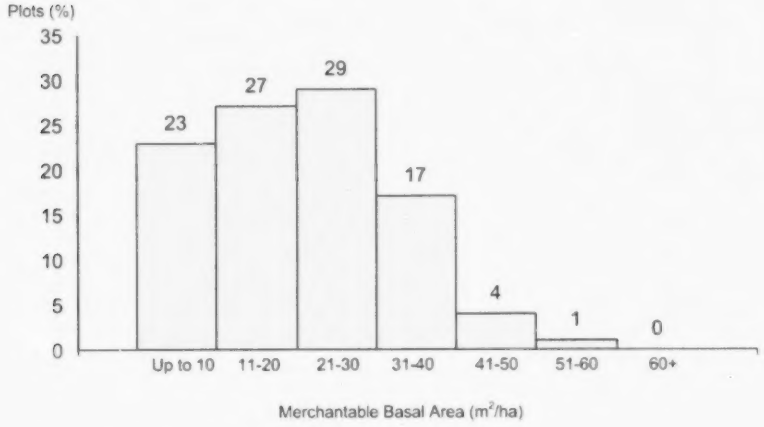

Figure 2 Percent of Plots by BA Class (m^2/ha).

[9] *Merchantable Basal Area is the cross-sectional area of all trees 9.1 cm DBH outside bark and greater and is reported in m^2/ha. It is an important variable in computing merchantable volume.*

3.4 Merchantable Volume by Species

Using the percent of each species of only the Merchantable volume on all 1923 plots and combining it with the Provincial merchantable volume, Table 6 was created. Sorted in descending order by volume, Spruce is the dominant softwood while Red Maple is the dominant hardwood. In 1998, some previous species that were clumped together are now separated. For example, Trembling and Largetooth Aspen are now split, and were previously combined as Aspen. The result of this will be available for analysis following data collection in 2002, when all plots have been visited. Figure 3 shows the broader species categories. Species identification in the plots is generally a more precise exercise than in Photo interpretation. Both Plots and Photo interpretation indicate that the leading softwood species is spruce, but the plots indicate that spruce merchantable volume is not as high (111 M m^3 versus 154) as Photo Interpretation. In addition, the plots indicate that there is approximately twice as much merchantable volume of balsam fir, white pine, white spruce and eastern hemlock as Photo Interpretation indicates. For hardwood species, the two methods generally agree on inventory level of the major divisions of tolerant and intolerant hardwood.

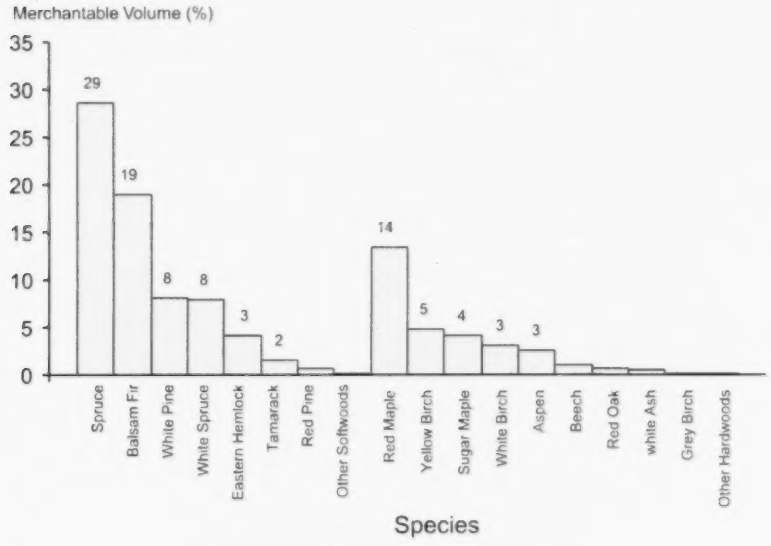

Figure 3 Percent of major softwood and hardwood species in Nova Scotia.

3.5 Land Capability

Land Capability is an indication of the maximum growth potential of forest volume on an area and is expressed in m^3/ha/yr. On the Forest Inventory Plots, the 3 best trees are selected by experienced cruisers to determine Land Capability. The Height and Age of these trees are recorded and put through a program to determine computed Land Capability. From these three trees, the best is chosen and used to categorize the plot. This method will under-estimate the Land Capability in plots where the trees have reached a climatic maximum height[10]. The results of this categorization appear in Table 7 and the province wide picture in Figure 4. Both Photo Interpretation and Plots indicate that a Land Capability of 5 m^3/ha/yr is the most common.

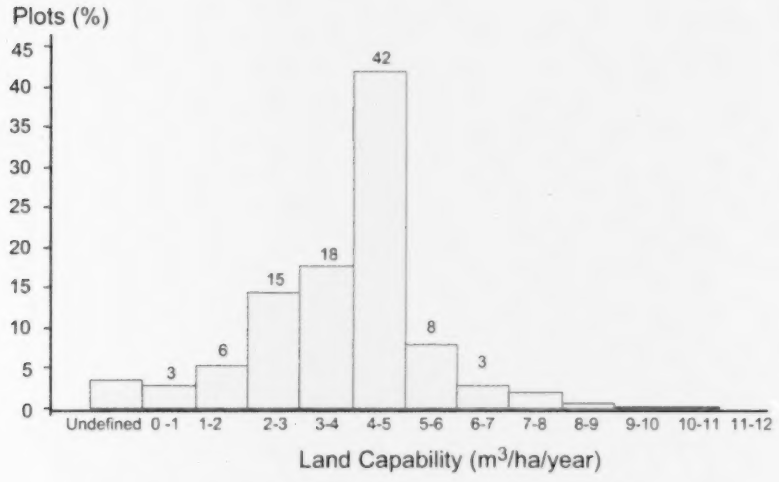

Figure 4 Provincial Forest area by Land Capability (m^3/ha/yr).

Literature Cited

NSDNR, FOR 1999-1. Forest Resources Inventory Report. Nova Scotia Department of Natural Resources, Forest Inventory Section. Cat. Log. Report FOR 1999-1. 29 pp.

[10] *When a tree hits it's climatic maximum height, the tree will continue to grow in diameter, but will show a very large reduction or perhaps even stop their height growth, therefore, the program will underestimate the actual Land Capability of the plot. This situation will occur more frequently: the older the plot becomes and may affect a significant proportion of stands 61years and older.*

Appendix I
Tables 1 to 7

Table 1. Provincial Area by Ownership and Forest Cover Type from Photo Interpretation Inventory (NSDNR, 1999).

Forest Cover Type	Crown (ha)	Large (ha)	Small (ha)	Federal (ha)	Total (ha)
Softwood	706,835	530,074	1,010,192	50,787	2,297,888
Mixedwood	257,286	202,463	554,022	25,900	1,039,671
Hardwood	160,948	100,553	256,629	13,171	531,301
Other	94,506	72,383	169,115	21,700	357,704
Total	**1,219,575**	**905,473**	**1,989,958**	**111,558**	**4,226,564**

Table 2. Provincial Merchantable Volume (m3) by Ownership and Forest Cover Type. Average plot m3/ha volumes were multiplied by area from Table 1.

Forest Cover Type	Crown m3	Large m3	Small m3	Federal m3	Total m3
Softwood					
Softwood	51,598,955	60,778,285	100,786,856	4,101,050	217,265,146
Hardwood	4,092,575	4,336,005	9,930,187	722,699	19,081,466
Total	**55,691,530**	**65,114,290**	**110,717,043**	**4,823,749**	**236,346,612**
Mixedwood					
Softwood	14,390,006	14,176,459	34,980,949	1,149,183	64,696,597
Hardwood	12,411,477	11,773,223	31,773,162	1,206,681	57,164,543
Total	**26,801,483**	**25,949,683**	**66,754,111**	**2,355,864**	**121,861,140**
Hardwood					
Softwood	988,221	1,307,189	2,137,720	47,811	4,480,940
Hardwood	14,309,887	8,796,376	24,849,386	1,151,014	49,106,663
Total	**15,298,107**	**10,103,565**	**26,987,106**	**1,198,824**	**53,587,603**
All					
Softwood	66,977,182	76,261,933	137,905,524	5,298,044	286,442,683
Hardwood	30,813,938	24,905,605	66,552,735	3,080,394	125,352,672
Total	**97,791,120**	**101,167,538**	**204,458,260**	**8,378,438**	**411,795,355**

Table 3. Provincial Area by Ownership, Forest Cover Type and Age Class, using Photo Interpretation Inventory total areas (Table 1) and representative fractions by plot.

Forest Cover/ Age Class	Ownership				
	Crown (ha)	Large (ha)	Small (ha)	Federal (ha)	Total (ha)
Softwood					
Up to 20 Years	22,801	12,546	24,460	2,309	62,116
21 to 40 Years	91,205	97,233	129,637	0	318,074
41 to 60 Years	257,653	147,417	384,020	6,926	796,015
61 to 80 Years	173,289	141,144	288,626	20,777	623,835
81 to 100 Years	116,286	81,550	132,083	13,851	343,770
101 + Years	43,322	50,185	46,474	6,926	146,906
Unevenaged	2,280	0	4,892	0	7,172
Total	**706,835**	**530,074**	**1,010,192**	**50,787**	**2,297,888**
Mixed					
Up to 20 Years	6,597	3,432	19,716	1,524	31,268
21 to 40 Years	29,687	22,305	61,120	3,047	116,159
41 to 60 Years	75,866	49,758	183,360	7,618	316,601
61 to 80 Years	82,463	66,916	197,161	7,618	354,158
81 to 100 Years	42,881	36,032	63,091	4,571	146,575
101 + Years	14,843	22,305	21,688	1,524	60,360
Unevenaged	4,948	1,716	7,886	0	14,550
Total	**257,286**	**202,463**	**554,022**	**25,900**	**1,039,671**
Hardwood					
Up to 20 Years	13,995	8,872	24,175	0	47,043
21 to 40 Years	10,497	2,957	20,456	0	33,910
41 to 60 Years	41,986	32,532	89,262	1,317	165,098
61 to 80 Years	47,235	17,745	78,104	2,634	145,718
81 to 100 Years	40,237	26,617	33,473	6,586	106,913
101 + Years	3,499	8,872	11,158	2,634	26,163
Unevenaged	3,499	2,957	0	0	6,456
Total	**160,948**	**100,553**	**256,629**	**13,171**	**531,301**
Other					
Up to 20 Years	94,506	72,383	169,115	21,700	357,704
21 to 40 Years	0	0	0	0	0
41 to 60 Years	0	0	0	0	0
61 to 80 Years	0	0	0	0	0
81 to 100 Years	0	0	0	0	0
101 + Years	0	0	0	0	0
Unevenaged	0	0	0	0	0
Total	**94,506**	**72,383**	**169,115**	**21,700**	**357,704**
Total					
Up to 20 Years	137,900	97,233	237,466	25,532	498,131
21 to 40 Years	131,388	122,495	211,213	3,047	468,143
41 to 60 Years	375,506	229,707	656,642	15,860	1,277,714
61 to 80 Years	302,987	225,804	563,892	31,028	1,123,711
81 to 100 Years	199,404	144,198	228,648	25,007	597,257
101 + Years	61,664	81,362	79,319	11,083	233,429
Unevenaged	10,727	4,673	12,778	0	28,178
Total	**1,219,575**	**905,473**	**1,989,958**	**111,558**	**4,226,564**

Table 4. Provincial Area by Basal Area Class, Forest Cover Type and Age Class, using Photo Interpretation Inventory total area (Table 1) and representative fractions from plots.

Forest Cover Age Class	Basal Area Class (m2/ha)							
	0 - 10 (ha)	36,850 (ha)	21 - 30 (ha)	31 - 40 (ha)	41 - 50 (ha)	51 - 60 (ha)	61+ (ha)	Total (ha)
Softwood								
Up to 20 Years	35,197	15,085	7,542	5,028	0	0	0	62,853
21 to 40 Years	155,874	93,022	42,740	20,113	0	0	0	311,748
41 to 60 Years	216,213	223,755	221,241	118,163	17,599	7,542	0	804,512
61 to 80 Years	123,191	153,360	181,015	140,790	25,141	0	0	623,497
81 to 100 Years	87,994	90,508	87,994	47,768	17,599	12,571	0	344,432
101 + Years	42,740	25,141	20,113	22,627	32,683	0	0	143,304
Unevenaged	2,514	2,514	2,514	0	0	0	0	7,542
Total	**663,723**	**603,384**	**563,159**	**354,488**	**93,022**	**20,113**	**0**	**2,297,888**
Mixed								
Up to 20 Years	7,270	7,270	3,635	10,906	1,818	0	0	30,899
21 to 40 Years	52,711	36,352	19,994	7,270	0	0	0	116,327
41 to 60 Years	43,623	87,245	118,144	52,711	9,088	1,818	1,818	314,446
61 to 80 Years	29,082	89,063	125,415	89,063	18,176	1,818	0	352,616
81 to 100 Years	12,723	34,535	56,346	36,170	7,270	0	0	149,044
101 + Years	5,453	19,994	16,358	14,541	5,453	0	0	61,799
Unevenaged	1,818	5,453	5,453	1,818	0	0	0	14,541
Total	**152,679**	**279,911**	**345,345**	**214,478**	**41,805**	**3,635**	**1,818**	**1,039,671**
Hardwood								
Up to 20 Years	29,086	9,695	5,817	1,939	0	0	0	46,537
21 to 40 Years	19,391	9,695	3,878	1,939	0	0	0	34,903
41 to 60 Years	21,330	48,476	65,928	25,208	1,939	0	0	162,881
61 to 80 Years	21,330	42,659	65,928	19,391	0	0	0	149,307
81 to 100 Years	5,817	27,147	42,659	27,147	3,878	0	0	106,648
101 + Years	0	11,634	9,695	1,939	1,939	0	0	25,208
Unevenaged	0	1,939	1,939	1,939	0	0	0	5,817
Total	**96,953**	**151,246**	**195,845**	**79,501**	**7,756**	**0**	**0**	**531,301**
Other								
Up to 20 Years	357,703	0	0	0	0	0	0	357,703
21 to 40 Years	0	0	0	0	0	0	0	0
41 to 60 Years	0	0	0	0	0	0	0	0
61 to 80 Years	0	0	0	0	0	0	0	0
81 to 100 Years	0	0	0	0	0	0	0	0
101 + Years	0	0	0	0	0	0	0	0
Unevenaged	0	0	0	0	0	0	0	0
Total	**357,703**	**0**	**0**	**0**	**0**	**0**	**0**	**357,703**
Total								
Up to 20 Years	429,257	32,050	16,995	17,873	1,818	0	0	497,992
21 to 40 Years	227,975	139,069	66,611	29,322	0	0	0	462,978
41 to 60 Years	281,165	359,476	405,313	196,081	28,626	9,360	1,818	1,281,839
61 to 80 Years	173,602	285,082	372,358	249,243	43,317	1,818	0	1,125,420
81 to 100 Years	106,534	152,189	186,999	113,084	28,747	12,571	0	600,124
101 + Years	48,193	56,769	46,167	39,107	40,075	0	0	230,310
Unevenaged	4,332	9,906	9,906	3,757	0	0	0	27,900
Total	**1,271,057**	**1,034,542**	**1,104,348**	**648,467**	**142,583**	**23,748**	**1,818**	**4,226,563**

Table 5. Provincial area by Merchantable Volume Class, Forest Cover Type and Age Class, using Photo Interpretation Inventory total area (Table 1) and representative fractions by plot.

Forest Cover Age Class	Merchantable Volume Class (m3/ha)					
	Less than 40 (ha)	41-80 (ha)	81-120 (ha)	121-160 (ha)	161+ (ha)	Total (ha)
Softwood						
Up to 20 Years	37,712	5,028	10,056	2,514	7,542	62,853
21 to 40 Years	168,445	75,423	37,712	15,085	15,085	311,748
41 to 60 Years	211,184	213,699	138,276	115,649	125,705	804,512
61 to 80 Years	120,677	115,649	115,649	93,022	178,501	623,497
81 to 100 Years	87,994	62,853	55,310	40,226	98,050	344,432
101 + Years	47,768	15,085	7,542	7,542	65,367	143,304
Unevenaged	2,514	2,514	2,514	0	0	7,542
Total	**676,293**	**490,250**	**367,059**	**274,037**	**490,250**	**2,297,888**
Mixedwood						
Up to 20 Years	7,270	5,453	3,635	5,453	9,088	30,899
21 to 40 Years	58,163	23,629	25,446	3,635	5,453	116,327
41 to 60 Years	41,805	72,704	87,245	54,528	58,163	314,446
61 to 80 Years	25,446	67,251	96,333	50,893	112,692	352,616
81 to 100 Years	9,088	21,811	32,717	30,899	54,528	149,044
101 + Years	5,453	10,906	12,723	9,088	23,629	61,799
Unevenaged	1,818	1,818	5,453	3,635	1,818	14,541
Total	**149,044**	**203,572**	**263,553**	**158,132**	**265,371**	**1,039,671**
Hardwood						
Up to 20 Years	27,147	11,634	0	5,817	1,939	46,537
21 to 40 Years	21,330	5,817	5,817	0	1,939	34,903
41 to 60 Years	27,147	36,842	40,720	31,025	27,147	162,881
61 to 80 Years	15,512	29,086	42,659	38,781	23,269	149,307
81 to 100 Years	5,817	15,512	23,269	15,512	46,537	106,648
101 + Years	0	5,817	5,817	7,756	5,817	25,208
Unevenaged	0	1,939	0	0	3,878	5,817
Total	**96,953**	**106,648**	**118,282**	**98,892**	**110,526**	**531,301**
Other						
Up to 20 Years	357,703	0	0	0	0	357,703
21 to 40 Years	0	0	0	0	0	0
41 to 60 Years	0	0	0	0	0	0
61 to 80 Years	0	0	0	0	0	0
81 to 100 Years	0	0	0	0	0	0
101 + Years	0	0	0	0	0	0
Unevenaged	0	0	0	0	0	0
Total	**357,703**	**0**	**0**	**0**	**0**	**357,703**
Total						
Up to 20 Years	429,832	22,115	13,692	13,784	18,569	497,992
21 to 40 Years	247,938	104,869	68,975	18,720	22,476	462,978
41 to 60 Years	280,136	323,245	266,241	201,202	211,015	1,281,839
61 to 80 Years	161,636	211,986	254,641	182,696	314,461	1,125,420
81 to 100 Years	102,899	100,176	111,296	86,637	199,115	600,124
101 + Years	53,221	31,807	26,083	24,387	94,813	230,310
Unevenaged	4,332	6,271	7,967	3,635	5,696	27,900
Grand Total	**1,279,993**	**800,470**	**748,894**	**531,061**	**866,146**	**4,226,563**

Table 6. Provincial Merchantable Volume by Species and Ownership, using total area and Total Merchantable Volume from Photo Interpretation Inventory (Table 1), and representative fraction of species on all plots.					
Species	**Crown**	**Large**	**Small**	**Federal**	**All**
			Softwood Volume(m3)		
Spruce	16,864,580	28,642,870	33,360,207	937,888	79,805,545
Balsam Fir	21,034,370	11,880,882	40,279,957	1,335,919	74,531,128
White Pine	11,628,614	10,100,911	7,986,337	1,884,927	31,600,789
White Spruce	5,227,137	3,334,142	22,531,091	240,191	31,332,560
Red Spruce	7,103,432	7,542,654	12,189,557	34,313	26,869,957
Eastern Hemlock	326,696	3,701,666	7,744,722	404,893	12,177,978
Tamarack	2,406,072	566,900	3,278,120	25,163	6,276,256
Black Spruce	3,096,990	804,710	1,216,779	1,088,866	6,207,345
Red Pine	1,825,525	290,656	487,582	157,840	2,761,603
Jack Pine	271,511	9,608	452,755	0	733,874
Scots Pine	0	0	76,185	0	76,185
Norway Spruce	22,074	0	6,530	0	28,604
Exotic Larch	0	0	2,177	0	2,177
	0	0	0	0	0
Total SW	**69,807,000**	**66,875,000**	**129,612,000**	**6,110,000**	**272,404,000**
			Hardwood Volume (m3)		
Red Maple	13,518,910	12,184,958	26,693,587	822,614	53,220,068
Yellow Birch	6,096,836	3,774,734	8,389,154	577,273	18,837,996
Sugar Maple	5,978,379	3,451,425	6,013,769	572,462	16,016,035
White Birch	3,383,429	2,720,831	5,621,804	418,523	12,144,587
Aspen	549,715	801,973	3,966,838	128,283	5,446,809
Beech	388,687	403,086	3,368,001	33,674	4,193,449
Red Oak	988,376	743,190	1,010,763	299,861	3,042,190
Large tooth Aspen	586,732	516,454	1,043,427	317,500	2,447,456
Trembling Aspen	340,564	165,853	1,830,988	0	2,337,405
White Ash	355,371	224,637	1,693,074	4,811	2,277,892
Grey Birch	107,352	46,187	707,716	0	861,254
Iron Wood	0	58,783	114,323	0	173,107
Black Cherry	37,018	2,099	94,362	0	133,479
Striped Maple	44,421	10,497	78,030	0	132,949
Hawthorn	0	0	85,289	0	85,289
Pin Cherry	20,360	2,099	61,698	0	84,158
Iron Wood	0	25,193	18,147	0	43,339
Elm	0	0	36,293	0	36,293
Apple	0	0	19,961	0	19,961
Mountain Maple	0	0	9,073	0	9,073
Black Ash	1,851	0	5,444	0	7,295
Balsam Poplar	0	0	5,444	0	5,444
Choke Cherry	0	0	1,815	0	1,815
Total HW	**32,398,000**	**25,132,000**	**60,869,000**	**3,175,000**	**121,574,000**
			Softwood & Hardwood Volume (m3)		
Total SW & HW	**102,205,000**	**92,007,000**	**190,481,000**	**9,285,000**	**393,978,000**

Table 7. Provincial Area by Ownership and Land Capability Class using total area from Photo Interpretation Inventory (Table 1) and representative fraction by plot.

Land Capability (m3/ha/yr)	Ownership				
	Crown (ha)	Large (ha)	Small (ha)	Federal (ha)	Total (ha)
Undefined	45,389	31,045	68,315	2,145	146,894
up to 0.5	0	2,587	2,204	2,145	6,936
0.6 to 1.5	47,362	15,522	48,482	4,291	115,657
1.6 to 2.5	80,910	46,567	77,130	19,308	223,916
2.6 to 3.5	221,023	119,005	253,428	15,017	608,473
3.6 to 4.5	203,262	155,224	383,447	8,581	750,515
4.6 to 5.5	493,355	416,518	819,783	42,907	1,772,563
5.6 to 6.5	65,123	67,264	196,131	12,872	341,390
6.6 to 7.5	33,548	18,109	70,519	4,291	126,467
7.6 to 8.5	15,787	23,284	46,278	0	85,349
8.6 to 9.5	7,894	7,761	11,019	0	26,673
9.6 to 10.5	1,973	2,587	6,611	0	11,172
10.6 to 11.5	1,973	0	4,407	0	6,381
12.6 to 13.5	1,973	0	2,204	0	4,177
13.6 to 14.5	0	0	0	0	0
Total	**1,219,574**	**905,473**	**1,989,958**	**111,558**	**4,226,563**

Appendix II

What is a Forest Inventory Plot (FIP)?[11]

A FIP is circular and 0.04 ha (1/10 of an acre) in size. Within that area, all trees greater than 9.1 cm in diameter at 1.3 metres above the ground are numbered with paint and measured for height and diameter. As well, each tree has a small tag attached at ground level. All live trees 3.1 cm to 9.0 cm in diameter are counted by species and have a small dot of paint put on them to avoid double-counting. A stake sits at the centre of the circle, with boundary marks put on the trees immediately outside the plot. Because a Global Positioning System is used in locating the plots, no tie lines are needed to mark the route to each site. All FIP's are remeasured every five years.

What Can FIP's Tells Us?

FIP's provide a wealth of forestry information to aid in the resource areas of ecosystem management, bio-diversity, wildlife habitat, forest protection and parks. In addition to the inventory of trees described previously, other data will be collected from small subplots within the larger plot. This will include indexing of woody debris, shrubs, regeneration and fire hazard, as well as some details on wildlife activity. When individual plot data is combined with data from other plots, we will be able to more effectively report on changes to our forest resources at regional and county levels. By participating in the inventory program, you are making a valuable contribution to the management of Nova Scotia's forests.

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[11] *From Forest Inventory Pamphlet.*